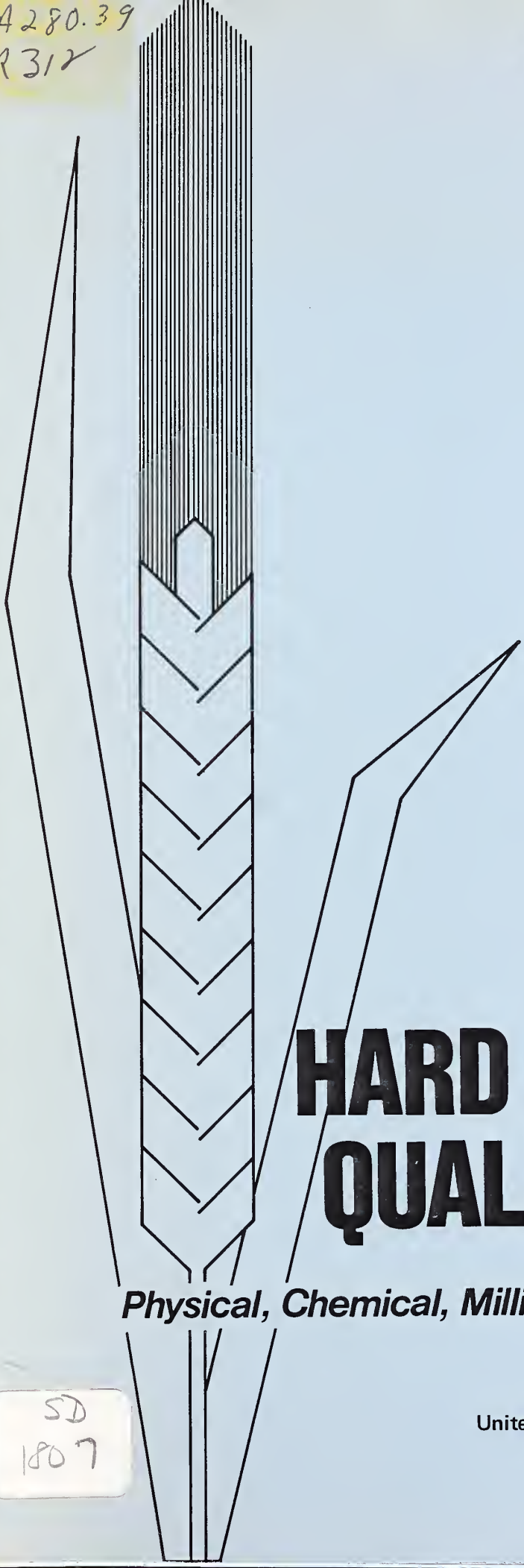


1982 CROP

HARD RED SPRING QUALITY REPORT

Physical, Chemical, Milling, and Baking Characteristics

United States Department of Agriculture
Agricultural Research Service
North Central Region

HARD RED SPRING QUALITY REPORT

On samples received from the 1982 crop

Source:

Spring and Durum Wheat Quality Laboratory
USDA, Agricultural Research Service
Cereal Chemistry & Technology, N.D.S.U.
Fargo, North Dakota 58105

REPORT OF PHYSICAL, CHEMICAL, MILLING AND BAKING EXPERIMENTS WITH HARD RED SPRING WHEAT

1982 CROP[1]/

by

R. D. Crawford, A. A. Ottenbacher, Technicians, J. E. Wohlman, Secretary, Agricultural Research Service; 2/ M. Skunberg and L. L. Nolte, Technicians, NDSU; 3/ Wallace H. Kunerth, Res. Chemist and V. L. Youngs, Research Leader.2/

Contents

1/ This is a progress report of cooperative investigations containing some results that have not been sufficiently confirmed to justify general release; interpretations may be modified with additional experimentation. Confirmed results will be published through established channels. Cooperators submitting samples for analysis have been given analytical data on their samples prior to release of this report. The report is primarily a tool for use of cooperators and their official staffs and to those persons having direct and special interest in the development of agricultural research programs.

This report was compiled by the Agricultural Research Service, U. S. Department of Agriculture. Special acknowledgment is made to the North Dakota State University for their facilities and services provided in support of these studies. The report is not intended for publication and should not be referred to in literature citations nor quoted in publicity or advertising. Use of the data may be granted for certain purposes upon written request to the agency or agencies involved.

2/ Hard Red Spring & Durum Wheat Quality Lab., NDSU.
3/ Dept. of Cereal Chemistry & Technology, NDSU.

1982 COOPERATING AGENCIES AND STATIONS

The cooperative agencies and stations conducting the varietal plot and nursery experiments from which the 1982 spring wheat samples were received are listed below:

Arizona Agricultural Experiment Station:

Mesa

University of California, Davis:

Imperial Valley

Minnesota Agricultural Experiment Station:

Crookston, Morris and St. Paul

Montana Agricultural Experiment Station:

Sidney, Bozeman and Havre

North Dakota Agricultural Experiment Station:

Carrington, Dickinson, Minot, Williston, Fargo and Langdon

South Dakota Agricultural Experiment Station:

Brookings, Redfield and Selby

Wisconsin Agricultural Experiment Station:

Madison

Wyoming Agricultural Experiment Station:

Sheridan

A complete list of all cooperating agencies, stations, and personnel for the year will be found in the report by R. H. Busch, et al., Wheat Varieties Grown in Cooperative Plot and Nursery Experiments in the Spring Wheat Region in 1982.4/

4/ Busch, R. H., and Cantrell, R. Wheat Varieties Grown in Cooperative Plot and Nursery Experiments in the Spring Wheat Region in 1982. Agricultural Research Service, U. S. Department of Agriculture and State Agricultural Experiments Station, St. Paul, MN.

INTRODUCTION

Samples of standard varieties and many of the new strains of hard red spring wheat grown in cooperative experiments in the spring wheat region of the United States4/ have been milled each year by the USDA. The flours were assayed chemically and physically and baked into bread to determine the quality characteristics. The purpose of this report is to make available to the cooperators, quality data on the standard varieties and new strains of hard red spring wheat from the 1982 crop.

The same general format and techniques were used in evaluating the wheat as outlined in quality reports for previous years. A new computer scoring system has been used this year, hence some faulting values differ slightly from previous years. In general, the data contained in this report are comparable to data in past reports and, where applicable, average results and also the average results of other crop years are compared. The area averages are tabulated for the Uniform Regional Nursery varieties of Butte, Era, Chris and Waldron. A five-year average (5-YA) and the averages for the individual five years include all selections grown in the Uniform Regional Nurseries for that year. These results give an overview of individual years and the influence of environment on the crop. The actual crop characteristics may be somewhat different due to differences in varieties, but the change from year to year is applicable.

The evaluation of a sample involves three areas of analysis: kernel characteristics, milling performance and baking evaluation. A brief description of the technique is given on pages 11 to 15 of this report. It is possible to deduce the various characteristics of the selection and any outstanding features or deficiencies which are apparent. No specific comments are made regarding the mixogram patterns, since reference mixograms for each of the general types are presented at the end of the report.

Seeding for the 1982 crop over the spring wheat area started the normal time, but a two week rainy period delayed most of the seeding until the last part of May and the first part of June.

The average flour extraction was 1.0% higher than the 1981 crop and 0.4% higher than the 5-year average. Wheat mineral content was equal to the 1981 crop and also equal to the 5-year average. The wheat protein content was 0.5% higher than both the 1981 crop and the 5-year average. The physical characteristics of the wheat was somewhat better than both the 1981 crop and the 5-year average. The bake

absorption was 1.5% higher than the 1981 crop and 1.4% higher than the 5-year average. Mix time was slightly shorter than the 1981 crop but equal to the 5-year average. The loaf volume for the 1982 crop was much lower than both the 1981 crop and the 5-year average. Oxidation requirements were slightly less.

SOURCE OF THE 1982 CROP SAMPLES

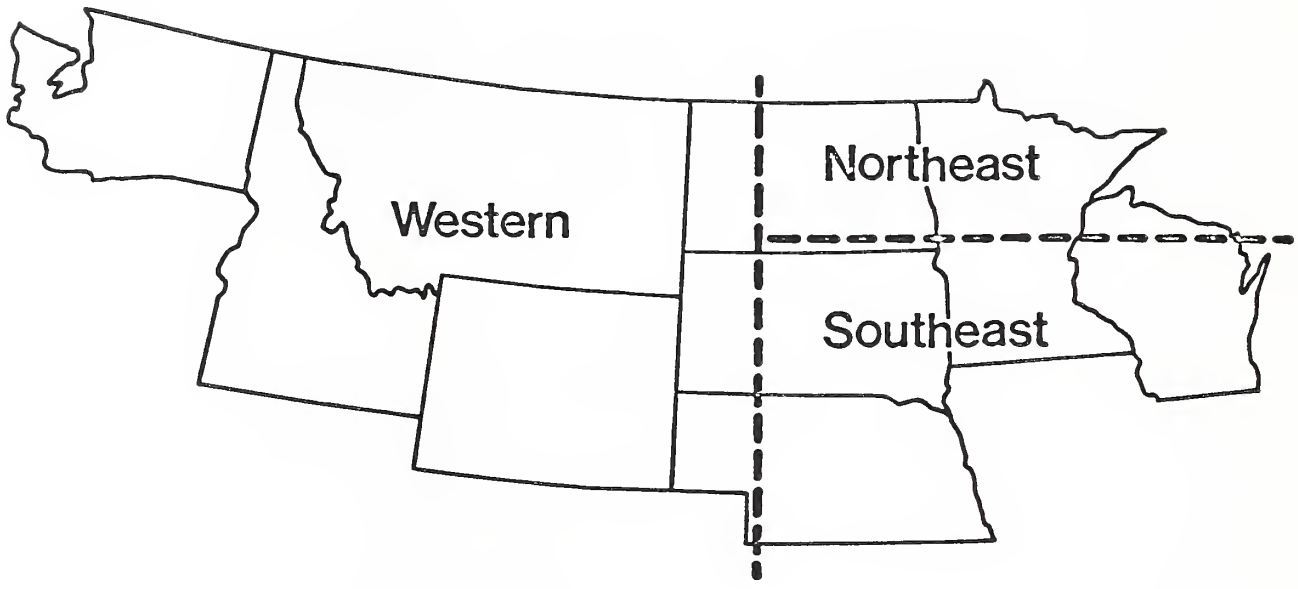
Tests were performed on 2,611 samples. However, data on 2,004 of these are not included in this report, because this information was of interest to plant breeders at specific experiment stations only. Data presented in this report are from the Field Plot Nursery and the Uniform Regional Nursery. The samples came from the 19 stations in eight states shown below:

Arizona: Mesa
California: Imperial Valley
Minnesota: Crookston, Morris and St. Paul
Montana: Bozeman, Havre and Sidney
North Dakota: Williston, Dickinson, Minot, Fargo, Langdon and Carrington
South Dakota: Brookings, Redfield and Selby
Wisconsin: Madison
Wyoming: Sheridan

On page 7 are listed the spring wheats that were included in the Uniform Regional Nursery trials. The variety or cross, the station that developed the variety, the state selection number and the C.I. number are given.

BLENDING AND AVERAGING PROCEDURES USED

Individual wheat samples from the Uniform Regional Nursery originating from the three geographical areas shown in the illustration on page 6 were blended according to area. All of the 17 stations were compatible for blending. Milling performance, mixograms and baking data were obtained from these area blends. However, data for kernel characteristics are arithmetical averages of individual sample analyses. These data from the Uniform Regional Nursery also are compared with averages from the previous four years (Table 4).



Wheat blends were made according to the geographical areas shown above.

Data for the Field Plot Nursery and the International Nursery are on the individual samples.

THE UNIFORM REGIONAL HARD RED SPRING WHEAT PERFORMANCE NURSERY

ry .	Cross or Variety	CI No. or Sel. No.	Year Entered	Source
	Marquis	3651	1929	Canada
	Chris	13751	1969	USDA-MN
	Waldron	13958	1964	ND
	Era	13986**	1972	USDA-MN
	Butte	17681	1979	ND
	Eureka/Prodax	SD 2861**	1981	SD
	James/SD2049	SD2854	1981	SD
	Eureka/Dawn	SD8015	1982	SD
	Spring/Winter composite	SD2903	1982	SD
	Protor/RL6010	SD2881	1982	SD
	TzPP/Son64//Selkirk	MT7836**	1980	USDA-MT
	FB439/MT7149	MT8017	1982	USDA-MT
	Fch/Nor 66//Kitt/3/MN7125	MN7529**	1982	USDA-MN
	Kitt/MN7222	MN7663	1982	USDA-MN
	Crim/Era* 2//MN6923 's'	MN7357**	1980	USDA-MN
	Crim/Era* 2//MN6923 's'	MN73167**	1981	USDA-MN
	Olaf/5/Jt/ND335//Pb/3/Wanken 2/4/ Cis/Wisc 261	ND574**	1980	ND
	ND527/Coteau's'//Era	ND582	1982	ND
	ND537/41 ND496's'/3/ND546// Giza 141/Na 710	ND586**	1982	ND
	ND559//ND522*2/Teewon	ND590**	1982	ND
	Butte *3/ND507	ND594	1982	ND
	Era/ Tob/Cno/3/Protor	NK77s 8002**	1982	North. King
	Tob//PV182/Cno	NK77S 4374**	1982	North. King
	Era/ B. Cimarron	NK77S 4342**	1982	North. King
	Kitt/MN70170	HS79304**	1981	N. Am. Pl. Br.
	MN70170/3/Angus//Cno/TZPP	HS79561**	1982	N. Am. Pl. Br.
	Era/3/Fch//Tob/Pk	HS79400**	1982	N. Am. Pl. Br.
		PR2369**	1982	Pioneer
		X7993**	1982	Pioneer
		X9882**	1982	Pioneer
	K71002/Magnif 41, K7700108	WA6922**	1982	WA
	K73557/Borah, K7900713	WA6923**	1982	WA
	MSFRS Germplasm C.C. A-1977	WRP-8-1	1982	West. Pl. Br.
		WRP-8-30	1982	West. Pl. Br.

Backcross
Semidwarf

METHODS

The terminology and methods used are briefly described below:

Test Weight Per Bushel - The weight per Winchester bushel of cleaned, dry, scoured wheat. To determine the dockage-free test weight on a comparable sample, approximately one pound per bushel should be subtracted from the value given.

1000 Kernel Weight - The 1000 kernel weight was determined by counting with a Seedburo seed counter the number of kernels in a 10 g sample of cleaned, picked wheat5/.

Kernel Size - The percentages of the size of the kernels (large, medium and small) were determined on a wheat sizer as described by Shuey6/.

The sieves of the sizer were clothed as follows:

Top Sieve - Tyler #7 with 2.92 mm opening
Middle Sieve - Tyler #9 with 2.24 mm opening
Bottom Sieve - Tyler #12 with 1.65 mm opening

Potential Yield - The potential yield is not shown on the computer tables, but it can be determined by multiplying the percentages of the overs of each sieve #7, #9 and #12 by the value of 78%, 73% and 68%, respectively. The accumulation percentage would be the potential yield.

Milling - The samples were cleaned by passing the wheat over an Emerson kicker and dockage tester and through a modified Forster scourer (Model 6). The clean, dry samples were pretempered to 12% moisture for at least 72 hours; then tempered to 16% moisture and allowed to stand overnight prior to milling.

5/ Mention of a trademark name or a proprietary product does not constitute a guarantee or warranty of the product by the U. S. Department of Agriculture, and does not imply its approval to the exclusion of other products that may also be suitable.

6/ Shuey, William C. A Wheat Sizing Technique for Predicting Flour Milling Yield. Cereal Science Today 5:71-72,75 (1960).

The Special Uniform Nursery Spring Wheat samples were milled on a Brabender Quadrumat Jr. mill. The mill was equipped with a #18 wire on the drum sieve. The throughs of the #18 wire were rebolted on a Strand sifter equipped with a #60 Tyler sieve. The sample was sifted for 1 minute. The throughs of the #60 wire classified as flour, and this was the material tested. The overs of the #18 wire were classified as bran, and the overs of the #60 Tyler sieve as crude shorts.

The Uniform Regional Nursery blends and the Field Plot Nursery samples were milled on a Buhler continuous experimental mill. This mill has been slightly modified to give results more comparable to commercial milling. The break scalping sieves were clothed with #54 stainless steel wire, the reduction scalping sieves with #58, #66 and #105 stainless steel wire for the first, second and third reduction, respectively. All of the flour sieves were clothed with #135 stainless steel wire.

All six flour streams were combined to give the patent flour. The extraction of a good milling wheat using this flow is approximately 68%. This is comparable to a commercial "long patent" extraction flour. At this flour extraction of the wheat, the changes in flour ash are most sensitive to changes in percent extraction.

Protein Content - Both the Kjeldahl procedure and the near infrared technique were used to determine protein content. Nitrogen values, as determined by the Kjeldahl procedure, were multiplied by 5.7 to calculate protein values.

Mineral Content or Ash Content - This was determined by measuring the residue of the minerals left after incinerating the sample for approximately 16 hours at 565°C. The results were reported as percentage of the sample that was incinerated.

Mixogram - The mixogram was determined by using 30 g of flour and adding 20 cc of water. The sensitivity spring setting was set at 10. All mixograms were run with constant weight of flour and volume of water. Absorptions reported were adjusted according to the height of the mixogram. The correction factor was determined from a series of flours by varying the amount of absorption.

Mixogram Pattern - The reference mixogram patterns given at the end of the report demonstrate the different types of mixograms that were obtained. A single number is assigned each pattern to characterize and simplify the classification of the curves--the larger number indicating stronger curve characteristics.

Baking Procedure or Formula - The baking formula used was as follows:

100% flour	3% milk D.S.M.
2% salt	3% yeast
5% sugar	2% shortening (Crisco, melted)

The samples were mixed to development in National Manufacturing mixers: the macro mixer for the 25 g samples and the 100 g special mixer for the 100 g samples. Bromate (5 ppm) for oxidation and barley malt flour (0.1%) for enzymatic supplement were added to each sample. All doughs were moulded in a Roll-Er-Up moulder.

Absorption - The amount of water, expressed as percent of the flour, required to bring the dough to proper consistency.

Crumb Color - A value was determined by comparing the loaf of the tested sample against a baking standard. This standard was selected as an average for the crop year for the spring wheat area.

Loaf Volume - The volume of the baked loaf as determined by seed displacement.

All values (protein, ash and absorption) were reported on a 14% moisture basis.

DISCUSSION

The following discussion presents some of the basic techniques and criteria used in the milling and baking quality evaluation of the samples. There are three major evaluation categories used: kernel characteristics, to characterize the kernel; milling performance, to evaluate the general milling characteristics; baking score, to evaluate the flour as to type and overall baking quality.

Each evaluation category can be important. A sample could be of a sufficiently poor quality for a given category to suggest elimination from future testing. However, a sample submitted for the first time and found to be questionable should be tested again to establish if it has a satisfactory or unsatisfactory classification. A sample which is consistently rated as questionable should be discarded.

Five characteristics (test weight, 1000 kernel weight, percent small kernels, wheat mineral and wheat protein) were independent variables used to calculate the dependent variable - wheat score. Four characteristics (percent extraction, mineral @ 65% extraction, flour protein and milling character) were used to calculate the dependent variable - mill score. Seven characteristics (mixogram pattern, bake absorption, mixing time, dough characteristics, crumb color, crumb grain and loaf volume) were used to calculate the dependent variable - bake score. These three dependent variables after calculation become independent variables used to calculate the dependent variable - general evaluation.

A new computer program has been designed and implemented to handle the analysis and tabulation for the data from each station. This program uses the Statistical Analysis Systems (SAS Institute, Inc., SAS Circle, Box 8000, Cary, NC 27511).

The samples are tested and data collected on 17 quality factors or variables. The program then grades each factor against predetermined faulting values and assigns major (MJ) or minor (MI) faults where applicable. The data is then broken down into 3 major areas of concern to relate more directly to agronomic, industrial and consumer requirements. Each sample is assigned a score of 4 in the areas of Wheat Characteristics, Milling Characteristics and Baking Characteristics. The program then adjusts the score (4 = Good promise, 3 = Some promise, 2 = Little promise, 1 = No promise) depending upon the number of major and/or minor faults assigned to that sample.

A general score is also given to each sample. This score is again 1-4 and is obtained by calculating the mean of the other 3 scores.

The following tables list the variables used in each scoring area and their specific faulting and scoring values.

WHEAT SCORE

Variables Included	Faulting Limits Minor	Faulting Limits Major	Effect on Score Minor	Effect on Score Major
Test Weight (#/bu)	57.9	56.9	-	-1
1000 Kernel Weight1/ (g)	Mean-2.1	Mean-5.1	-	-1
Small Kernels (%)	8	16	-	-1
Wheat Mineral (%)	1.71	1.81	-	-
Wheat Protein (%)	13.9	12.9	-1	-2

1/ The mean, or average, is calculated using the data from the standards tested with that station.

MILL SCORE

Variables Included	Faulting Limits Minor	Faulting Limits Major	Effect on Score Minor	Effect on Score Major
Flour Extraction1/ (%)	Mean-2.1	Mean-4.1	-1	-2
Flr. Mineral @ 65% Ex.2/				
Large Samples	.47	.51	-	-1
Small Samples	.57	.61	-	-1
Flour Protein (%)	12.9	12.4	-1	-2
Milling Character3/	3	2	-1	-2

1/ The mean, or average, is calculated using the standards tested with that station.

2/ The large samples are milled on a Buhler experimental mill, and the small samples are milled on a Quadrumat Jr. experimental mill. Different values are used to compensate for the difference in the efficiency of the two mills and their respective procedures.

3/ 5 = Normal. 4 = Normal-soft. 3 = Soft-normal. 2 = Soft. 1 = Gritty. 0 = Very soft.

BAKE SCORE

Variables Included	Faulting Limits Minor	Faulting Limits Major	Effect on Score Minor	Effect on Score Major
Mixogram Pattern1/	2,7 or 8	1,or 9-11	-	-1
Bake Absorption (%)	61.9	60.4	-1	-2
Mix Time (min.)	5.75-8.00 or 2.00-2.75	0-1.75 or over 8.00	-1	-2
			-1	-2
Dough Characteristic2/	6,5	4 or less	-	-2
Crumb Color3/	6-4	3 or less	-	-1
Crumb Grain4/	7-4	3 or less	-	-1
Loaf Volume5/ (cc) Lg.	Mean-55	Mean-105	-1	-2
Sm.	Mean-21	Mean-31	-1	-2

1/ Refer to reference mixograms for numerical curve pattern. (1 = very weak--11 = very strong)

2/ 9 = Elastic. 8 = Slightly elastic. 7 = Slightly pliable. 6 = Pliable. 5 = Very pliable. 4 = Very elastic. 3 = Bucky. 2 = Very, very pliable. 1 = Extremely pliable. 0 = Dead.

3/ The column headed Crumb Color on the data tables has two scores. The first score is the brightness, or sheen, of the grain as compared to the standard(s). (Standard = 100.) The second score is a single digit indicating the color of the interior of the loaf. 9 = Bright white. 8 = White. 7 = Normal. 6 = Slightly creamy. 5 = Bright creamy. 4 = Creamy. 3 = Very creamy. 2 = Gray. 1 = Very gray. 0 = Dull.

4/ The column on the data tables headed Crumb Grain also has two scores. The first score is a numerical comparison against the standard(s). The second score indicates the structure of the grain. 12 = Normal. 11 = Slightly irregular. 10 = Slightly open. 9 = Slightly irregular and open. 8 = Slightly open and irregular. 7 = Irregular. 6 = Open. 5 = Irregular and slightly open. 4 = Open and slightly irregular. 3 = Irregular and open. 2 = Open and irregular. 1 = Harsh. 0 = Soggy.

5/ The mean, or average, is calculated using the standards tested with that station. "Lg." refers to the faulting and scoring values for 100 g. loaves. "Sm." refers to the faulting and scoring values for 25 g. (pup) loaves.

All samples, as in previous years, are compared with a milling and baking standard that represents a blend of the crop year blended to a known quality. However, the samples for the individual stations are evaluated against the average results of the check varieties from the respective stations. The agronomic and climatic conditions of the individual locations can affect the quality of the wheat sample, such that the evaluation at certain locations could have all samples--even the named varieties--classified as questionable to unsatisfactory. Therefore, the evaluation ratings of one station are not directly comparable with those of another station. For example, an area may produce low protein wheats which give large and plump kernels, good milling and kernel characteristics, but low protein and unsatisfactory baking properties such as short mixing time, low loaf volume and weak dough characteristics. The wheat from this area could not be considered as a strong spring wheat and would not maintain the quality expected from the spring wheat producing area. A good variety should have tolerance to a wide range of environmental conditions and the overall picture should be taken into consideration for establishing these varieties.

Kernel Characteristics are important in determining the initial value of the wheat and, if extremely poor, could disqualify a new variety from further consideration. Because of the present grading system, it is desirable to have a good test weight. If a sample has a low 1000 kernel weight and small kernel size distribution, it would be considered a poor sample for milling because of the high ratio of bran to endosperm. Therefore, it is desirable to have plump kernels. Wheat ash is an important factor when comparing a variety against other standard varieties. If a sample consistently has higher wheat mineral content, it increases the probability of having high flour ash. Lower protein than the standard varieties is not desirable, because in a low protein crop year the probability of it having such a low protein as to be undesirable is much greater. Therefore, the protein must also be considered as a characteristic when comparing varieties grown in the same locality.

Milling Performance is very important, especially the subcategory of milling characteristics. If low extraction or high flour ash is obtained, these become major factors which are quite unacceptable from a commercial milling standpoint. All flour mineral contents are reported at a constant extraction of 65%, so that the figures are directly comparable. As a rule of thumb, one can approximate that each point of ash (0.01%) is equivalent to approximately 2% in extraction.

Milling characteristics are important. A sample which tends to be soft in character requires a different milling technique to be milled properly. On commercial mills flowed for hard vitreous spring wheats, soft milling characteristics cause great difficulty. Therefore, if a sample shows softness in character, it is considered to be unsatisfactory. Likewise, a sample which is extremely hard and vitreous will cause difficulty. Both types of wheat (soft and vitreous) require different roll pressures, clothing, sifter surface and temper to be milled properly. If these wheats are blended with normal milling wheats, improper results are obtained since these characteristics are not necessarily compatible or additive. Normal to soft score indicates that the sample shows a tendency toward softness of character on the flour mill stocks and extraction. This would indicate that the sample may give some difficulty for certain mill streams, and an adjustment would either have to be made in the milling flow or in tempering procedures to compensate for these differences. The properties of this wheat may or may not be compatible with other wheats with which it may be blended; therefore, it is important to maintain varieties with milling characteristics as uniform as possible.

The amount of protein recovered in the flour for a sample is of importance. High protein wheats yielding low protein flours are not desirable. Such a wheat would have much of the protein distributed in the outer portion of the kernel which would result in excessive protein in the feed. Therefore, higher wheat protein would be necessary to yield a flour with protein content comparable to that of a wheat that gives good flour protein recovery.

Mixogram Patterns and Farinogram Patterns are important in estimating the strength and mixing tolerance or potential mixing tolerance of a flour. A long, flat curve is more desirable than a short, peaked curve; however, an extremely long curve may be undesirable, if the flour would require excessive mixing for proper development. Both the pattern and length of the curve are important, and both must be considered. Abnormal curves, such as sway-back or long initial time to incorporate the water, indicate undesirable characteristics.

Baking Evaluation takes into account the flour absorption, mixing time, dough characteristics, loaf volume and machinability. A sample which has low absorption would be unsatisfactory. A sample with extremely short mixing time would also be considered undesirable as a good strong spring wheat. When a sample is in the minimal range for these values, it is considered to be questionable until further testing demonstrates whether a definite deficiency exists.

Doughs having mellow to weak dough properties show a tendency towards weakness. Also, for mellow to strong, the dough is mellow but has a tendency to be strong, and a strong to mellow dough is just the reverse. Since these characteristics are subjective rather than objective, it is necessary at times to estimate the tendency; therefore, the necessity exists for apparent double grades.

The grain or appearance of the interior of the loaf shows how well the sample stood up during baking and may point out or explain some deficiencies which have been observed during the baking test.

Loaf volume indicates potential strength of the flour in a different manner than mixing time or dough characteristics in that it shows the ability or lack thereof for the dough to expand under pressure and to contain the entrapped gases during this expansion. Weak flours act much like rotten balloons, which burst when blown up and collapse and yield low loaf volume or extremely large volume and large holes in the interior of the loaf. Low protein flours and lifeless (dead) doughs exhibit properties similar to putty and do not expand during fermentation or baking and give low loaf volume. Tough and very bucky doughs are bound too tightly and impede expansion of the gases causing low loaf volume.

General Evaluation rating applies only to the data contained in the year of the report. However, a summation of total and major deficiencies, and an average General Evaluation score for the number of years the sample has been tested are included in the discussion of individual varieties and selections of the Uniform Regional Nursery.

UNIFORM REGIONAL NURSERY SAMPLES - 1982 CROP

Discussion of Area Blends

A total of 573 Uniform Regional Nursery samples were received. The samples were from 17 stations in 6 states. Wheat blends were made of the samples for this crop year by area. The areas tend to represent movement of the wheat in the market (See map, page 6). Kernel characteristics were determined on individual samples to eliminate possible erroneous results. The area blends were then milled and baked by our macro method. Thirty-four samples were received from each of the 17 stations. Twenty-nine selections were included for quality evaluation in the Uniform Regional Nursery samples. The remainder of the samples were the commercially named varieties, Butte, Chris, Era, Marquis and Waldron.

Data from the northeast area blend are given in Table 1. The five stations included in this blend were Minot, Fargo, Langdon, Carrington, North Dakota and Crookston, Minnesota.

Data for the southeast area blend are given in Table 2. The six stations included in this blend were Brookings, Redfield and Selby, South Dakota, Morris and St. Paul, Minnesota and Madison, Wisconsin.

Data for the western area blend are given in Table 3. The six stations included in this blend were Williston and Dickinson, North Dakota, Bozeman, Havre and Sidney, Montana and Sheridan, Wyoming. Williston and Langdon, North Dakota each submitted two extra samples which were not included in the area blend. These samples were processed individually, and the data are reported in Tables 5 and 6.

Discussion of Area and Crop Year Averages

In Table 4 are given the average area results for the combined data of the varieties, Butte, Chris, Era and Waldron samples submitted from the 6 states and 17 stations. The area average represents all samples that were grown in that area for the year cited.

The milling and baking results were obtained from the area blend of the wheats in equal proportions from each of the stations for the respective variety or selection. The regular 100 g straight dough rich formula was used in baking. The General Evaluation column includes the overall performance of the blend of each sample. The general evaluation given for the sample area blend may not agree with that of the individual wheat samples within the blend, since

averages do not express the range, and poor characteristics may be masked. In an endeavor to clarify this problem, we have included in the discussion of the varieties and selections the average general evaluation, the number of total deficiencies and the number of major deficiencies -- (Average General Evaluation - #Total Deficiencies/#Major Deficiencies).

Also given in Table 4 are comparisons of the previous five crop years, which include all selections grown in the Uniform Regional Nursery for that year, as well as the 5 YA. 1982 crop kernel characteristics (test weight and 1000 kernel weight) were slightly better than from the 5 YA. The wheat and flour protein contents were 0.5% higher. Milling extraction was also up 1/2% from the 5 YA. Bake absorption was higher by 1.5%, and mixing time was equal to the 5 YA. Dough was slightly more mellow than the 5 YA. Crumb grain was equal, and loaf volume was much lower than the 5 YA.

A comparison of the 1982 and 1981 crop results shows the 1982 crop better than the 1981 crop. The 1982 crop shows the test weight 1.0 lb. higher, 1000 KW higher, wheat protein 0.5% higher, flour extraction 1.0% higher, bake absorption 1.5% higher, mix time 0.75 min. shorter, dough character, crumb color and crumb grain were all about equal, but the loaf volume was down.

Discussion of Individual Varieties or Selections

For simplicity and brevity, as in previous reports, each selection or variety will be discussed from the general viewpoint rather than the individual areas. General Evaluation summarizes the results from the individual areas for one crop year.

Average results of the varieties Butte, Chris and Waldron for each of the individual areas were used as standards for the other selections from that area; therefore, a variety or selection may be rated satisfactory in two different areas, but comparison of the data may show much poorer results for one area due to adverse environmental conditions. Thus the sample with poor results could be rated as having unsatisfactory quality when compared with the overall spring wheat area, even though it may be rated as showing good promise for one area.

By using the same format as used in previous years and employment of the computer, all named varieties receive a general evaluation. Only those varieties in the "Good Promise" category could be consistently considered as acceptable to the trade both in the domestic, as well as foreign

markets. Data for the named varieties of Butte, Chris, Era, Marquis and Waldron will be an average of each variety for the last three years.

Butte	(3.9 - 4/0)7/	- Good Promise
Chris	(3.9 - 20/0)	- Good Promise
Era	(2.5 - 28/9)	- Little Promise
Marquis	(2.7 - 25/5)	- Little Promise
Waldron	(3.4 - 12/4)	- Some Promise

HS 79304 (2.7 - 18/5) (2 yrs.)

Faults (1982 crop only):

Kernel Characteristics - 1,000 KWT, test weight, wheat ash and small kernels.

Milling Performance - Ash at 65% extraction.

Baking Evaluation - Crumb color and loaf volume.

General Evaluation - Little promise.

HS 79400 (3.9 - 8/1) (1 yr.)

Faults:

Kernel Characteristics - Test weight, small kernels, wheat ash and wheat protein.

Milling Performance - Ash at 65% extraction.

Baking Evaluation - Crumb grain.

General Evaluation - Good promise.

HS 79561 (3.9 - 7/1) (1 yr.)

Faults:

Kernel Characteristics - Test weight, wheat ash.

Milling Performance - Satisfactory.

Baking Evaluation - Crumb color and crumb grain.

General Evaluation - Good promise.

7/ (Average General Evaluation - # Total Deficiencies/Major Deficiencies)

MN 7357 (2.7 - 29/8) (3 yrs.)

Faults (1982 crop only):

Kernel Characteristics - Test weight, wheat ash.

Milling Performance - Satisfactory.

Baking Evaluation - Dough character, crumb color, crumb grain and loaf volume.

General Evaluation - Little promise.

MN 7529 (3.4 - 8/1) (1 yr.)

Faults:

Kernel Characteristics - Wheat ash and wheat protein.

Milling Evaluation - Flour protein.

Baking Evaluation - Crumb grain.

General Evaluation - No promise.

MN 7663 (3.8 - 5/1) (1 yr.)

Faults:

Kernel Characteristics - 1,000 KWT, wheat ash.

Milling Performance - Satisfactory.

Baking Evaluation - Dough character and crumb grain.

General Evaluation - Good promise.

MN 73167 (3.1 - 20/6) (2 yrs.)

Faults (1982 crop only):

Kernel Characteristics - Test weight, small kernels, wheat ash, wheat protein.

Milling Performance - Satisfactory.

Baking Evaluation - Mixograph score, mix time, dough character, crumb color, crumb grain and loaf volume.

General Evaluation - Some promise.

MT 7836 (2.8 - 26/8) (3 yrs.)

Faults (1982 crop only):

Kernel Characteristics - Small kernels, wheat ash.

Milling Performance - Satisfactory.

Baking Evaluation - Mixogram score, mix time, dough character and crumb grain.

General Evaluation - Little promise.

MT 8017 (3.2 - 14/4) (1 yr.)

Faults:

Kernel Characteristics - Small kernels, wheat ash.

Milling Performance - Satisfactory.

Baking Evaluation - Mixogram score, mix time, dough character, crumb grain, loaf volume.

General Evaluation - Some promise.

ND 574 (3.4 - 9/2) (3 yrs.)

Faults (1982 crop only):

Kernel Characteristics - Wheat ash.

Milling Performance - Satisfactory.

Baking Evaluation - Crumb grain.

General Evaluation - Some promise.

ND 582 (3.7 - 5/2) (1 yr.)

Faults:

Kernel Characteristics - Wheat ash.

Milling Performance - Satisfactory.

Baking Evaluation - Dough character and crumb grain.

General Evaluation - Good promise.

ND 586 (3.9 - 4/1) (1 yr.)

Faults:

Kernel Characteristics - 1,000 KWT, wheat ash.

Milling Performance - Satisfactory.

Baking Evaluation - Crumb grain.

General Evaluation - Good promise.

ND 590 (3.8 - 7/2) (1 yr.)

Faults:

Kernel Characteristics - Wheat ash.

Milling Performance - Satisfactory.

Baking Evaluation - Mixogram score, dough character, crumb grain.

General Evaluation - Good promise.

ND 594 (3.4 - 6/3) (1 yr.)

Faults:

Kernel Characteristics - Wheat ash.

Milling Performance - Satisfactory.

Baking Evaluation - Dough character and crumb grain.

General Evaluation - Some promise.

NK 77S4342 (3.4 - 9/2) (1 yr.)

Faults:

Kernel Characteristics - Wheat ash.

Milling Performance - Flour extraction.

Baking Evaluation - Mix time and crumb grain.

General Evaluation - Some promise.

NK 77S4374 (3.1 - 9/4) (1 yr.)

Faults:

Kernel Characteristics - Small kernels, wheat ash, wheat protein.

Milling Performance - Flour protein.

Baking Evaluation - Crumb grain.

General Evaluation - Some promise.

NK 77S8002 (2.9 - 15/9) (1 yr.)

Faults:

Kernel Characteristics - Wheat ash and wheat protein.

Milling Performance - Satisfactory.

Baking Evaluation - Mixogram score, mix time, dough character, crumb grain.

General Evaluation - Little promise.

PR 2369 (3.1 - 12/5) (1 yr.)

Faults:

Kernel Characteristics - Wheat ash.

Milling Performance - Satisfactory.

Baking Evaluation - Mixogram score, mix time, dough character and crumb grain.

General Evaluation - Some promise.

SD 2854 (3.7 - 9/1) (2 yrs.)

Faults (1982 crop only):

Kernel Characteristics - Wheat ash.

Milling Performance - Satisfactory.

Baking Evaluation - Mix time, dough character and crumb grain.

General Evaluation - Good promise.

SD 2861 (3.0 - 16/4) (2 yrs.)

Faults (1982 crop only):

Kernel Characteristics - Wheat ash.

Milling Performance - Satisfactory.

Baking Evaluation - Mixogram score, dough character, crumb color and crumb grain.

General Evaluation - Some promise.

SD 2881 (3.6 - 6/2) (1 yr.)

Faults:

Kernel Characteristics - Small kernels and wheat ash.

Milling Performance - Flour extraction.

Baking Evaluation - Crumb grain and loaf volume.

General Evaluation - Good promise.

SD 2903 (3.6 - 4/2) (1 yr.)

Faults:

Kernel Characteristics - Satisfactory.

Milling Performance - Satisfactory.

Baking Evaluation - Mix time, dough character, crumb grain.

General Evaluation - Good promise.

SD 8015 (3.4 - 9/3) (1 yr.)

Faults:

Kernel Characteristics - Wheat ash.

Milling Performance - Satisfactory.

Baking Evaluation - Mixogram score, dough character, crumb grain.

General Evaluation - Some promise.

WA 6922 (3.6 - 13/4) (1 yr.)

Faults:

Kernel Characteristics - Test weight, 1,000 KWT, small kernels, wheat ash.

Milling Performance - Flour extraction.

Baking Evaluation - Dough character, crumb color, crumb grain.

General Evaluation - Good promise.

WA 6923 (3.8 - 8/3) (1 yr.)

Faults:

Kernel Characteristics - Test weight, small kernels, wheat ash.

Milling Performance - Satisfactory.

Baking Evaluation - Dough character, crumb grain.

General Evaluation - Good promise.

WRP-8-1 (2.9 - 15/6) (1 yr.)

Faults:

Kernel Characteristics - Small kernels, wheat ash, wheat protein.

Milling Performance - Flour protein.

Baking Evaluation - Mixogram score, mix time, dough character, crumb color, crumb grain.

General Evaluation - Some promise.

WRP-8-30 (2.9 - 16/4) (1 yr.)

Faults:

Kernel Characteristics - Small kernels, wheat ash, wheat protein.

Milling Performance - Flour protein.

WRP-8-30 (Cont'd)

Baking Evaluation - Mixogram score, mix time, dough character, crumb grain, loaf volume.

General Evaluation - Some promise.

X 7993 (3.2 - 9/3) (1 yr.)

Faults:

Kernel Characteristics - Wheat ash.

Milling Performance - Satisfactory.

Baking Evaluation - Mixogram score, mix time, dough character, crumb grain.

General Evaluation - Some promise.

X 9882 (3.7 - 7/0) (1 yr.)

Faults:

Kernel Characteristics - Wheat ash.

Milling Performance - Flour extraction.

Baking Evaluation - Mix time, crumb grain.

General Evaluation - Good promise.

1982 UNIFORM REGIONAL REGIONAL HARD RED SPRING WHEAT NURSERY SAMPLES NOT INCLUDED IN THE AREA BLENDS

WILLISTON, NORTH DAKOTA

The 1982 milling and baking standard was used as the standard. The two selections were Alex and Olaf. The data for these samples are given in Table 5.

LANGDON, NORTH DAKOTA

The 1982 milling and baking standard was used as the standard. The two selections were MPY-2 and MPY-3. The data for these samples are given in Table 6.

FIELD PLOT NURSERY SAMPLES - 1982 CROP

Thirty-four samples were received from two states. The data for the individual samples are given in Tables 7 and 8.

MESA, ARIZONA

Eighteen samples were received from this station. Our 1982 standard was used as the standard. The data for these samples are given in Table 7. The average general score is 1.7.

IMPERIAL VALLEY, CALIFORNIA

Our 1982 standard was also used as the standard for this station. Sixteen samples were received. The data for these samples are given in Table 8. The average general score is 2.2.

EXPLANATION OF ABBREVIATIONS LISTED UNDER THE HEADINGS AND THOSE THAT MAY BE LISTED UNDER MINOR AND MAJOR DEFICIENCIES ON COMPUTER PRINTOUT

TW = Test Weight
KW = 1,000 Kernel Weight
LG = Large Kernels
SM = Small Kernels

WM = Wheat Mineral
WP = Wheat Protein
EX = Flour Extraction
M65 = Mineral at 65% Flour Extraction

FP FLR. PRO = Flour Protein
MC MLG. CHAR = Milling Characteristics
MLG. PER = Milling Performance
MIX. ABS = Mixograph Absorption

MX MIX. PAT = Mixograph Pattern Score
BA BAKE ABS. = Actual Bake Absorption
MT MIX TIME = Actual Dough Mixing Requirements

DC DOUGH CHAR = Dough Handling Characteristics
CC CRUMB COLOR = Example - 100 5
100 = Score received for brightness of the crumb grain
5 = Creamy-the color characteristic of that particular loaf (only the second score is faulted)

CG CRUMB GRAIN = Example - 86 5
86 = Score received for crumb grain
5 = Open-or characteristic of that loaf's crumb grain (only the second score is faulted)

LV LOAF VOL = Loaf Volume

FOOTNOTES FOR TABLES

1/ Clean dry - Subtract 1 lb/bu for dockage-free TW.

2/ 14% Moisture basis.

3/ 5 = Normal. 4 = Normal-soft. 3 = Soft-normal. 2 = Soft. 1 = Gritty. 0 = Very soft.

4/ Refer to reference mixograms for numerical curve pattern. (1 = Very weak - - - 11 = Very strong.)

5/ 9 = Elastic. 8 = Slightly elastic. 7 = Slightly pliable. 6 = Pliable. 5 = Very pliable. 4 = Very elastic. 3 = Bucky. 2 = Very, very pliable. 1 = Extremely pliable. 0 = Dead.

6/ First column: A realistic score of brightness compared with a 1982 ND standard scored as 100. Second column: 9 = Bright white. 8 = White. 7 = Normal. 6 = Slightly creamy. 5 = Bright creamy. 4 = Creamy. 3 = Very creamy. 2 = Gray. 1 = Very gray. 0 = Dull.

7/ First column: A relative overall crumb grain score as compared with a 1982 ND standard scored as 90. Second column: 12 = Normal. 11 = Slightly irregular. 10 = Slightly open. 9 = Slightly irregular and slightly open. 8 = Slightly open and slightly irregular. 7 = Irregular. 6 = Open. 5 = Irregular and slightly open. 4 = Open and slightly irregular. 3 = Irregular and open. 2 = Open and irregular. 1 = Harsh. 0 = Soggy.

QUALITY DATA OF SPRING WHEAT SAMPLES 1982 CROP

TABLE 1 STATE=REGIONAL BLENDS STATION=NORTHEASTERN AREA NURSERY=UNIFORM

VARIETY	STD	TEST WT #/BU 1/	1000 K.WT G.	SIZING LG %	SIZING SM %	WHT ASH % 2/	WHT PRO % 2/	WHEAT SCORE ***	FLR EXT %	ASH @ 65%EX % 2/	FLR PRO % 2/	MILL CHAR 3/	MILL SCORE ***	MIX ABS %	MIX PAT 4/
BUTTE	S	61.9	35.0	51	1	1.59	14.6	4	71.0	0.34	13.9	5	4	66.3	5
CHRIS	S	60.5	30.2	33	3	1.77	16.0	4	71.0	0.37	15.0	5	4	66.3	4
ERA		60.2	29.9	30	5	1.70	13.8	3	72.7	0.40	13.1	5	4	63.5	4
MARQUIS		59.9	30.2	30	2	1.80	14.5	4	69.8	0.42	13.8	5	4	64.2	4
WALDRON	S	60.1	35.9	60	2	1.80	15.2	4	70.3	0.39	14.6	5	4	64.7	5
HS 79304		59.4	30.6	41	3	1.71	14.2	4	71.8	0.42	13.4	5	4	64.4	5
HS 79400		59.2	33.0	38	3	1.71	13.9	3	71.7	0.46	13.4	5	4	67.6	5
HS 79561		59.1	34.1	56	2	1.76	14.3	4	71.4	0.38	13.5	5	4	67.3	5
MN 7357		58.3	32.0	39	3	1.64	14.1	4	72.0	0.39	13.2	5	4	65.7	6
MN 7529		59.9	38.5	65	2	1.62	13.4	3	72.3	0.37	12.8	5	3	65.0	4
MN 7663		61.8	30.3	53	2	1.66	14.3	4	72.4	0.36	13.1	5	4	62.3	5
MN 73167		59.2	33.0	41	3	1.66	13.9	3	72.4	0.39	13.1	5	4	62.8	6
MT 7836		58.7	32.1	35	4	1.83	14.5	4	70.0	0.39	13.8	5	4	64.2	5
MT 8017		60.3	33.5	35	2	1.73	15.6	4	70.7	0.40	15.0	5	4	64.7	6
ND 574		59.3	35.7	57	1	1.72	15.2	4	69.5	0.39	14.2	5	4	65.7	5
ND 582		61.0	34.1	43	2	1.69	15.2	4	71.5	0.36	14.5	5	4	67.9	6
ND 586		59.9	28.5	44	2	1.72	14.4	3	71.9	0.37	13.9	5	4	64.2	4
ND 590		58.6	32.4	52	2	1.75	14.7	4	69.9	0.39	13.9	5	4	66.3	6
ND 594		60.9	34.0	48	2	1.67	15.1	4	70.6	0.35	14.3	5	4	67.6	5
NK 77S 4342		60.4	32.4	36	2	1.75	14.6	4	68.4	0.42	13.4	4	3	64.2	3
NK 77S 4374		61.5	35.1	50	3	1.62	13.2	3	72.4	0.37	12.2	5	2	62.8	6
NK 77S 8002		60.2	32.2	36	4	1.71	14.0	4	71.9	0.37	13.5	5	4	65.0	10
PR 2369		61.6	33.6	38	3	1.68	14.2	4	72.0	0.37	13.4	5	4	65.0	8
SD 2854		59.5	34.0	43	3	1.67	14.8	4	71.7	0.34	13.8	5	4	65.3	5
SD 2861		59.2	37.2	45	2	1.71	14.2	4	69.7	0.38	13.4	5	4	64.2	5
SD 2881		61.0	33.7	55	2	1.64	15.1	4	70.1	0.41	14.2	5	4	66.0	6
SD 2903		60.6	32.8	40	2	1.63	14.8	4	71.1	0.34	14.2	5	4	67.9	5
SD 8015		60.9	33.4	37	3	1.76	14.1	4	70.6	0.38	13.4	5	4	66.6	7
WA 6922		57.2	28.9	16	5	1.71	14.5	4	70.8	0.36	14.3	5	4	67.0	5
WA 6923		56.5	32.5	36	4	1.77	14.7	3	69.8	0.38	14.0	5	4	65.3	5
WRP-8-1		60.8	35.1	35	5	1.69	13.7	3	72.2	0.37	12.7	5	3	64.2	6
WRP-8-30		60.8	35.0	30	5	1.64	13.8	3	72.5	0.37	12.9	5	3	64.4	6
X 7993		60.6	38.2	56	1	1.70	14.6	4	70.3	0.37	14.0	5	4	65.7	6
X 9882		59.1	37.0	51	2	1.71	14.4	4	68.3	0.37	13.2	4	3	68.2	5

QUALITY DATA OF SPRING WHEAT SAMPLES 1982 CROP

TABLE 1 (Cont.) STATE=REGIONAL BLENDS STATION=NORTHEASTERN AREA NURSERY=UNIFORM

VARIETY	STD	BAKE ABS % 2/	MIX TIME MIN	DOUGH CHAR 5/	CRUMB COLOR 6/	CRUMB GRAIN 7/	LOAF VOL CC	BAKE SCORE ***	GENERAL SCORE ***	DEFICIENCIES TW	KW	SM	WA	WP	EX	A65	FP	MC	MX	BA	MT	DC	CC	CG	LV
BUTTE	S	66.8	3.25	9	102 8	88 6	850	4	4.0															M1	
CHRIS	S	67.2	3.00	8	101 7	89 6	870	4	4.0		MI		MI											M1	
ERA		64.7	4.00	9	102 8	89 6	855	4	3.7		MI			MI										M1	
MARQUIS		65.1	3.75	8	101 8	89 6	800	3	3.7		MI		MI											M1	M1
WALDRON	S	65.2	3.25	9	101 8	88 6	875	4	4.0				MI											M1	
HS 79304		65.1	4.00	9	101 4	89 12	855	4	4.0		M1		MI										M1		
HS 79400		68.8	3.75	8	102 8	89 6	870	4	3.7				MI	MI										M1	
HS 79561		68.2	4.00	8	101 4	88 6	845	4	4.0				MI										M1	M1	
MN 7357		66.4	4.25	9	101 4	87 6	865	4	4.0														M1	M1	
MN 7529		66.0	3.50	7	102 8	89 6	885	4	3.3					MI			MI							M1	
MN 7663		62.9	3.50	9	101 8	89 12	870	4	4.0		M1														
MN 73167		63.4	4.25	9	101 7	88 12	835	4	3.7					MI											
MT 7836		65.1	4.25	9	103 9	88 10	885	4	4.0				MJ												
MT 8017		65.6	5.75	9	102 8	88 6	870	3	3.7				M1								MI			M1	
ND 574		66.7	3.50	8	100 7	87 3	855	3	3.7				MI											MJ	
ND 582		69.1	4.25	8	101 7	88 6	910	4	4.0															MI	
ND 586		65.1	3.00	9	101 7	88 12	880	4	3.7		MJ		M1												
ND 590		66.1	3.75	9	100 8	87 6	895	4	4.0				MI											M1	
ND 594		67.6	3.50	9	101 8	85 2	840	3	3.7															MJ	
NK 77S 4342		64.4	2.75	7	103 9	88 6	885	3	3.3				MI		MI						MI			M1	
NK 77S 4374		63.3	4.25	8	102 8	87 3	815	3	2.7					MI			MJ							MJ	
NK 77S 8002		65.2	8.50	4	102 8	86 2	860	1	3.0				MI						MJ		MJ	MJ		MJ	
PR 2369		65.6	7.50	9	100 7	85 2	915	2	3.3										MI		MI			MJ	
SD 2854		66.0	3.25	8	101 7	86 6	905	4	4.0															MI	
SD 2861		64.9	3.50	9	100 4	89 6	825	4	4.0				MI										M1	M1	
SD 2881		66.5	4.00	8	102 8	89 6	845	4	4.0															M1	
SD 2903		68.6	4.00	8	100 7	86 2	880	3	3.7															MJ	
SD 8015		67.3	5.25	4	100 7	88 6	900	2	3.3				MI						MI			MJ		MI	
WA 6922		67.9	3.75	5	101 4	88 12	845	4	4.0	MI	MI		M1									MI	MI		
WA 6923		66.0	3.50	6	101 7	89 12	880	4	3.7	MJ			MI									MI			
WRP-8-1		65.1	6.00	7	101 4	87 3	840	2	2.7					MI			MI				MI		M1	MJ	
WRP-8-30		65.3	6.00	8	100 7	88 6	860	3	3.0					MI			M1				M1			MI	
X 7993		66.4	5.75	9	99 7	88 6	900	3	3.7												MI			MI	
X 9882		69.2	3.25	9	101 8	88 6	950	4	3.7				MI		MI									MI	

DEFICIENCIES	TW	KW	SM	WA	WP	EX	A65	FP	MC	MX	BA	MIX TIME (MT)		DC	CC	CG	LV
MINOR FAULTING VALUES	57.9	31.6	8	1.71	13.9	68.7	.47	12.9	3	2.7-8	61.9	5.75-8.00	2.00-2.75	6	6	7	810
MAJOR FAULTING VALUES	56.9	28.6	16	1.81	12.9	66.7	.51	12.4	2	1.9-11	60.4	UNDER 1.75	OVER 8.00	4	3	3	760

*** 1=NO PROMISE 2=LITTLE PROMISE 3=SOME PROMISE 4=GOOD PROMISE.

See page 30 for footnotes.

QUALITY DATA OF SPRING WHEAT SAMPLES 1982 CROP

STATE=REGIONAL BLENDS STATION=SOUTHEASTERN AREA NURSERY=UNIFORM

TABLE 2

VARIETY	STD	TEST WT #/BU 1/	1000 K.WT G.	SIZING LG %	SIZING SM %	WHT ASH % 2/	WHT PRO % 2/	WHEAT SCORE ***	FLR EXT %	ASH @ 65%EX % 2/	FLR PRO % 2/	MILL CHAR 3/	MILL SCORE ***	MIX ABS %	MIX PAT 4/
BUTTE	S	61.5	31.0	27	4	1.68	14.9	4	71.2	0.36	13.9	5	4	67.9	5
CHRIS	S	60.0	26.9	18	6	1.76	15.9	4	69.5	0.40	15.1	5	4	65.7	4
ERA		58.6	26.8	21	10	1.80	13.9	3	70.6	0.44	13.1	5	4	64.2	6
MARQUIS		58.5	27.2	15	6	1.80	14.9	4	69.6	0.44	14.1	5	4	64.4	5
WALDRON	S	58.7	30.0	26	4	1.90	16.0	4	69.6	0.44	15.2	5	4	66.3	6
HS 79304		57.5	27.9	24	8	1.86	14.6	4	70.0	0.47	14.0	5	4	66.3	6
HS 79400		57.8	29.6	21	9	1.86	15.2	4	69.7	0.49	14.7	5	4	68.5	6
HS 79561		57.9	31.5	33	5	1.80	14.9	4	70.1	0.42	14.4	5	4	65.7	4
MN 7357		57.9	30.2	26	7	1.76	14.1	4	70.8	0.41	13.2	5	4	65.0	6
MN 7529		59.2	34.8	42	5	1.71	13.7	3	71.7	0.41	12.7	5	3	65.0	4
MN 7663		60.0	29.2	38	5	1.75	14.2	4	71.2	0.41	13.3	5	4	64.2	5
MN 73167		57.9	30.6	28	8	1.78	14.2	4	71.1	0.42	13.3	5	4	64.7	7
MT 7836		58.3	29.0	16	8	1.82	14.2	4	69.3	0.43	13.7	5	4	64.2	7
MT 8017		58.9	29.7	14	8	1.98	15.7	4	68.6	0.43	15.1	4	4	66.6	7
ND 574		58.9	30.8	30	4	1.87	15.1	4	68.6	0.42	14.0	4	4	66.3	6
ND 582		60.3	30.2	22	5	1.78	15.4	4	69.8	0.40	14.7	5	4	67.3	6
ND 586		59.1	28.0	23	5	1.80	15.1	4	70.1	0.40	14.4	5	4	65.3	6
ND 590		58.1	30.5	31	6	1.82	14.8	4	69.2	0.43	13.7	5	4	66.0	7
ND 594		60.4	31.9	30	5	1.73	15.5	4	70.1	0.37	14.8	5	4	66.3	6
NK 77S 4342		58.8	29.6	23	6	1.91	15.6	4	67.6	0.46	14.2	4	3	64.4	5
NK 77S 4374		59.4	32.4	28	8	1.74	14.1	4	70.2	0.42	13.1	5	4	63.2	6
NK 77S 8002		58.8	29.7	19	7	1.80	15.1	4	69.9	0.41	14.4	5	4	65.7	9
PR 2369		60.5	30.6	20	7	1.79	14.8	4	70.0	0.41	14.3	5	4	64.2	9
SD 2854		58.7	30.2	25	7	1.73	15.7	4	70.1	0.36	14.8	5	4	65.0	5
SD 2861		59.2	34.1	28	5	1.77	14.3	4	68.8	0.42	13.8	4	4	63.8	7
SD 2881		60.2	31.0	26	14	1.71	15.4	4	65.6	0.46	14.2	4	2	65.0	6
SD 2903		60.8	30.6	30	4	1.68	14.8	4	70.4	0.36	14.1	5	4	64.4	5
SD 8015		60.1	28.9	19	6	1.79	14.9	4	68.3	0.39	14.0	4	4	63.5	8
WA 6922		56.5	26.3	8	16	1.82	15.3	2	67.2	0.40	15.0	4	3	64.2	5
WA 6923		55.2	28.0	16	8	1.82	15.1	3	69.6	0.39	14.3	5	4	64.2	5
WRP-8-1		59.6	28.9	16	10	1.74	14.7	4	70.8	0.41	14.0	5	4	63.2	10
WRP-8-30		59.8	28.8	16	10	1.73	14.3	4	70.4	0.39	13.6	5	4	63.2	9
X 7993		58.9	32.1	31	4	1.87	15.9	4	69.0	0.42	15.1	5	4	64.2	8
X 9882		58.7	34.4	32	5	1.76	15.3	4	67.2	0.41	14.3	4	3	67.0	5

QUALITY DATA OF SPRING WHEAT SAMPLES 1982 CROP

TABLE 2 (Cont.) STATE=REGIONAL BLENDS STATION=SOUTHEASTERN AREA NURSERY=UNIFORM

VARIETY	STD	BAKE ABS % 2/	MIX TIME MIN	DOUGH CHAR 5/	CRUMB COLOR 6/		CRUMB GRAIN 7/		LOAF VOL CC	BAKE SCORE ***	GENERAL SCORE ***	DEFICIENCIES TW	KW	SM	WA	WP	EX	A65	FP	MC	MX	BA	MT	DC	CC	CG	LV
BUTTE	S	68.6	5.00	8	100	7	88	6	825	4	4.0															MI	
CHRIS	S	66.3	4.00	9	102	7	88	6	920	4	4.0		MI		MI											MI	
ERA		65.3	4.00	9	101	7	87	6	875	4	3.7		MI	MI	MI	MI										MI	
MARQUIS		65.0	4.50	9	101	7	88	6	850	4	4.0				MI											MI	
WALDRON	S	67.3	4.00	8	100	7	89	12	885	4	4.0				MJ												
HS 79304		67.4	4.75	9	101	4	89	12	790	3	3.7	MI		MI	MJ			MI						MI			MI
HS 79400		69.9	4.50	9	101	8	88	6	940	4	4.0	MI		MI	MJ			MI								MI	
HS 7956I		66.9	4.00	9	100	7	89	12	850	4	4.0	MI			MI												
MN 7357		66.2	5.00	9	100	7	88	6	850	4	4.0	MI			MI											MI	
MN 7529		66.4	4.50	7	102	7	87	6	860	4	3.3				MI	MI			MI							MI	
MN 7663		65.2	3.75	9	102	8	88	6	845	4	4.0				MI											MI	
MN 73167		65.8	6.00	4	101	8	87	2	870	1	3.0	MI		MI	MI						MI		MI	MJ		MJ	
MT 7836		65.4	5.75	3	100	7	88	2	840	1	3.0			MI	MJ						MI		MI	MJ		MJ	
MT 8017		67.5	7.50	3	102	8	87	2	820	1	3.0			MI	MJ						MI		MI	MJ		MJ	MI
ND 574		67.0	4.50	9	101	7	89	12	890	4	4.0				MJ												
ND 582		68.3	4.50	3	101	7	87	1	825	1	3.0				MI									MJ		MJ	
ND 586		66.0	4.00	9	101	7	89	12	875	4	4.0				MI												
ND 590		66.3	4.25	4	101	7	87	6	920	2	3.3				MJ						MI			MJ		MI	
ND 594		66.7	4.25	4	101	8	88	6	885	2	3.3				MI									MJ		MI	
NK 77S 4342		64.8	3.25	9	102	8	88	3	985	3	3.3				MJ		MI									MJ	
NK 77S 4374		63.9	5.25	9	101	8	86	3	870	3	3.7			MI	MI											MJ	
NK 77S 8002		66.1	7.00	3	100	8	88	3	875	1	3.0				MI						MJ		MI	MJ		MJ	
PR 2369		64.6	8.00	3	101	8	86	3	850	1	3.0				MI						MJ		MI	MJ		MJ	
SD 2854		65.3	3.00	4	100	7	89	12	935	2	3.3				MI									MJ			
SD 286I		64.3	5.00	3	100	7	87	3	885	1	3.0				MI						MI			MJ		MJ	
SD 2881		65.4	3.75	9	100	8	88	2	830	3	3.0			MI	MI		MJ									MJ	
SD 2903		64.7	4.25	4	102	8	89	12	880	2	3.3													MJ			
SD 8015		64.1	5.50	4	101	8	88	6	860	2	3.3				MI						MI			MJ		MI	
WA 6922		64.7	3.25	8	101	4	88	12	855	4	3.0	MJ	MI	MJ	MJ		MI								MI		
WA 6923		64.9	3.50	9	100	7	88	6	905	4	3.7	MJ		MI	MJ											MI	
WRP-8-I		63.8	7.75	3	101	8	87	3	855	1	3.0			MI	MI						MJ		MI	MJ		MJ	
WRP-8-30		63.8	7.00	3	101	7	87	2	790	1	3.0			MI	MI						MJ		MI	MJ		MJ	MI
X 7993		64.7	6.75	4	100	8	89	12	990	1	3.0				MJ						MI		MI	MJ			
X 9882		68.0	3.00	8	101	8	88	12	980	4	3.7				MI		MI										

DEFICIENCIES	TW	KW	SM	WA	WP	EX	A65	FP	MC	MX	BA	MIX TIME (MT)		DC	CC	CG	LV
MINOR FAULTING VALUES	57.9	27.2	8	1.71	13.9	68.0	.47	12.9	3	2.7-8	61.9	5.75-8.00	2.00-2.75	6	6	7	822
MAJOR FAULTING VALUES	56.9	24.2	16	1.81	12.9	66.0	.51	12.4	2	1.9-11	60.4	UNDER 1.75	OVER 8.00	4	3	3	772

*** 1=NO PROMISE 2=LITTLE PROMISE 3=SOME PROMISE 4=GOOD PROMISE.

See page 30 for footnotes.

QUALITY DATA OF SPRING WHEAT SAMPLES 1982 CROP

TABLE 3 STATE=REGIONAL BLENDS STATION=WESTERN AREA NURSERY=UNIFORM

VARIETY	STD	TEST WT #/BU 1/	1000 K.WT G.	SIZING LG %	SIZING SM %	WHT ASH % 2/	WHT PRO % 2/	WHEAT SCORE ***	FLR EXT %	ASH @ 65%EX % 2/	FLR PRO % 2/	MILL CHAR 3/	MILL SCORE ***	MIX ABS %	MIX PAT 4/
BUTTE	S	61.8	32.0	35	2	1.52	14.8	4	70.6	0.32	14.1	5	4	67.6	5
CHRIS	S	60.7	28.5	28	3	1.54	15.5	4	71.3	0.34	15.0	5	4	67.6	4
ERA		61.1	29.5	29	4	1.50	13.9	3	72.1	0.34	13.2	5	4	65.3	5
MARQUIS		60.6	29.7	30	3	1.61	15.3	4	68.8	0.36	14.6	4	4	66.0	4
WALDRON	S	60.5	33.6	51	2	1.62	15.4	4	70.5	0.35	14.8	5	4	67.9	5
HS 79304		60.0	30.7	35	4	1.58	14.1	4	71.3	0.37	13.6	5	4	66.6	6
HS 79400		60.4	33.7	34	4	1.57	14.3	4	71.7	0.35	13.9	5	4	66.6	5
HS 79561		60.7	36.4	60	2	1.60	14.7	4	71.2	0.33	14.2	5	4	67.3	4
MN 7357		60.2	34.4	46	4	1.55	14.1	4	72.0	0.34	13.3	5	4	67.9	6
MN 7529		60.9	36.9	56	2	1.51	14.0	4	70.7	0.34	13.1	5	4	67.9	5
MN 7663		62.0	31.1	51	2	1.51	14.3	4	71.1	0.32	13.6	5	4	67.0	5
MN 73167		60.5	35.0	46	3	1.51	14.1	4	71.5	0.34	13.3	5	4	67.3	6
MT 7836		61.0	34.7	44	2	1.60	14.6	4	70.9	0.33	14.2	5	4	68.2	6
MT 8017		60.7	33.5	29	3	1.63	15.6	4	70.4	0.35	15.1	5	4	69.1	7
ND 574		59.9	34.1	44	2	1.59	15.3	4	69.2	0.35	14.4	5	4	69.7	6
ND 582		60.9	30.1	29	3	1.57	14.7	4	70.8	0.34	14.2	5	4	70.0	6
ND 586		60.2	29.5	40	3	1.64	14.8	4	71.2	0.35	14.3	5	4	68.2	5
ND 590		59.7	32.3	42	3	1.63	14.6	4	70.5	0.37	13.8	5	4	68.8	6
ND 594		61.7	31.8	37	2	1.52	15.1	4	70.3	0.32	14.5	5	4	68.2	5
NK 77S 4342		61.7	34.9	47	2	1.52	14.5	4	69.1	0.35	13.5	5	4	64.4	4
NK 77S 4374		62.5	36.4	49	2	1.42	13.7	3	72.2	0.32	12.8	5	3	65.0	6
NK 77S 8002		61.3	33.3	37	2	1.55	13.9	3	72.5	0.33	13.7	5	4	66.3	8
PR 2369		62.0	34.7	45	2	1.50	14.2	4	71.1	0.32	13.7	5	4	64.4	8
SD 2854		59.6	32.2	30	2	1.63	15.2	4	70.9	0.32	14.6	5	4	66.0	4
SD 2861		60.4	37.2	44	2	1.56	14.4	4	69.3	0.36	13.8	5	4	65.0	5
SD 2881		61.8	31.8	35	2	1.50	15.3	4	69.6	0.39	14.3	5	4	67.0	5
SD 2903		62.3	31.7	35	1	1.50	14.9	4	70.1	0.34	14.5	5	4	67.3	4
SD 8015		61.9	32.8	37	2	1.53	14.2	4	69.8	0.35	13.8	5	4	66.0	6
WA 6922		59.5	30.3	17	5	1.52	14.6	4	71.1	0.33	14.4	5	4	66.3	4
WA 6923		59.3	31.4	39	3	1.60	14.5	4	71.5	0.32	13.9	5	4	67.9	5
WRP-8-1		61.8	35.3	35	3	1.50	14.0	4	72.8	0.31	13.3	5	4	66.3	7
WRP-8-30		62.1	35.4	37	3	1.49	13.8	3	73.1	0.31	13.2	5	4	65.0	7
X 7993		60.3	34.1	49	2	1.61	15.2	4	70.8	0.34	14.5	5	4	66.6	6
X 9882		60.4	36.7	51	2	1.55	14.5	4	68.8	0.35	13.6	4	4	69.7	5

QUALITY DATA OF SPRING WHEAT SAMPLES 1982 CROP

TABLE 3 (Cont.) STATE=REGIONAL BLENDS STATION=WESTERN AREA NURSERY=UNIFORM

VARIETY	STD	BAKE ABS % 2/	MIX TIME MIN	DOUGH CHAR 5/	CRUMB COLOR 6/		CRUMB GRAIN 7/		LOAF VOL CC	BAKE SCORE ***	GENERAL SCORE ***	DEFICIENCIES TW	KW	SM	WA	WP	EX	A65	FP	MC	MX	BA	MT	DC	CC	CG	LV
BUTTE	S	68.0	3.00	9	100	7	88	6	815	4	4.0															MI	
CHRIS	S	68.1	3.25	8	101	7	88	6	825	4	4.0				MI											MI	
ERA		65.9	4.00	8	102	8	89	6	825	4	3.7					MI										MI	
MARQUIS		66.5	3.00	9	102	8	88	6	845	4	4.0															MI	
WALDRON	S	68.9	3.00	9	101	8	87	3	870	3	3.7															MJ	
HS 79304		67.2	4.00	9	100	4	89	12	805	4	4.0														MI		
HS 79400		67.7	3.50	9	102	8	90	12	860	4	4.0														MI	MJ	
HS 79561		68.4	3.00	8	101	4	87	2	790	3	3.7																
MN 7357		69.1	4.00	4	100	7	86	3	755	1	3.0												MJ		MJ		MI
MN 7529		69.2	3.25	9	101	7	87	3	855	3	3.7														MJ		
MN 7663		68.0	3.50	4	102	8	88	6	810	2	3.3												MJ		MI		
MN 73167		68.2	4.75	4	101	4	86	3	770	1	3.0												MJ	MI	MJ		MI
MT 7836		69.3	4.50	4	102	8	87	3	810	1	3.0												MJ		MJ		
MT 8017		70.1	6.50	4	102	8	82	6	825	1	3.0										MI		MI	MJ	MI		
ND 574		71.2	3.50	9	101	7	88	6	845	4	4.0														MI		
ND 582		71.4	4.50	9	101	7	88	6	800	4	4.0														MI		
ND 586		69.1	3.25	9	101	7	87	6	790	4	4.0														MI		
ND 590		69.9	3.75	9	101	7	87	6	785	4	4.0														MI		
ND 594		68.4	3.50	3	101	7	85	6	790	2	3.3												MJ		MI		
NK 77S 4342		64.8	2.50	9	103	9	88	6	800	3	3.7														MI		
NK 77S 4374		65.4	4.75	9	102	8	87	2	795	3	3.0					MI		MI							MJ		
NK 77S 8002		66.7	7.50	4	104	9	88	3	830	1	2.7					MI					MI		MI	MJ	MJ		
PR 2369		64.4	6.75	3	101	7	88	6	810	1	3.0										MI		MI	MJ	MI		
SD 2854		66.5	2.25	8	101	7	89	12	885	3	3.7												MI				
SD 2861		65.4	3.25	9	101	7	87	6	800	4	4.0														MI		
SD 2881		67.5	3.25	9	102	7	89	12	760	3	3.7																MI
SD 2903		67.6	2.75	9	100	7	88	6	805	3	3.7												MI		MI		
SD 8015		66.4	4.50	9	101	7	87	2	865	3	3.7														MJ		
WA 6922		66.9	3.00	6	100	7	87	1	840	3	3.7													MI	MJ		
WA 6923		68.8	3.75	9	100	7	88	6	865	4	4.0														MI		
WRP-8-1		66.6	7.00	3	100	7	82	2	810	1	3.0										MI		MI	MJ	MJ		
WRP-8-30		65.5	6.25	4	101	7	88	7	790	1	2.7					MI					MI		MI	MJ	MI		
X 7993		66.9	6.00	4	101	7	86	6	825	1	3.0												MI	MJ	MI		
X 9882		70.8	2.75	9	101	8	88	7	890	3	3.7												MI		MI		

DEFICIENCIES	TW	KW	SM	WA	WP	EX	A65	FP	MC	MX	BA	MIX TIME (MT)		DC	CC	CG	LV
MINOR FAULTING VALUES	57.9	29.3	8	1.71	13.9	68.7	.47	12.9	3	2.7,8	61.9	5.75-8.00	2.00-2.75	6	6	7	782
MAJOR FAULTING VALUES	56.9	26.3	16	1.81	12.9	66.7	.51	12.4	2	1.9-11	60.4	UNDER 1.75	OVER 8.00	4	3	3	732

*** 1=NO PROMISE 2=LITTLE PROMISE 3=SOME PROMISE 4=GOOD PROMISE.

See page 30 for footnotes.

QUALITY DATA OF UNIFORM REGIONAL BLENDS

AREA AND CROP-YEAR AVERAGES

TABLE 4

VARIETY	STD	TEST WT #/BU 1/	1000 K.WT G.	SIZING LG %	SIZING SM %	WHT ASH % 2/	WHT PRO % 2/	WHEAT SCORE ***	FLR EXT %	ASH @ 65%EX % 2/	FLR PRO % 2/	MILL CHAR 3/	MILL SCORE ***	MIX ABS %	MIX PAT 4/
SOUTHEASTERN AREA AVERAGES															
BUTTE	S	61.5	31.0	27	4	1.68	14.9	4	71.2	0.36	13.9	5	4	67.9	5
CHRIS	S	60.0	26.9	18	6	1.76	15.9	4	69.5	0.40	15.1	5	4	65.7	4
ERA		58.6	26.8	21	10	1.80	13.9	3	70.6	0.44	13.1	5	4	64.2	6
WALDRON	S	58.7	30.0	26	4	1.90	16.0	4	69.6	0.44	15.2	5	4	66.3	6
AREA AVERAGE		59.9	33.4	43	3	1.70	14.5	4	71.0	0.38	13.7	5	4	65.4	5
NORTHEASTERN AREA AVERAGES															
BUTTE	S	61.9	35.0	51	1	1.59	14.6	4	71.0	0.34	13.9	5	4	66.3	5
CHRIS	S	60.5	30.2	33	3	1.77	16.0	4	71.0	0.37	15.0	5	4	66.3	4
ERA		60.2	22.9	30	5	1.70	13.8	2	72.7	0.40	13.1	5	4	63.5	4
WALDRON	S	60.1	35.9	60	2	1.80	15.2	4	70.3	0.39	14.6	5	4	64.7	5
AREA AVERAGE		59.0	30.0	24	7	1.79	14.9	4	69.6	0.42	14.1	5	4	65.2	6
WESTERN AREA AVERAGES															
BUTTE	S	61.8	32.0	35	2	1.52	14.8	4	70.6	0.32	14.1	5	4	67.6	5
CHRIS	S	60.7	28.5	28	3	1.54	15.5	4	71.3	0.34	15.0	5	4	67.6	4
ERA		61.1	29.5	29	4	1.50	13.9	3	72.1	0.34	13.2	5	4	65.3	5
WALDRON	S	60.5	33.6	51	2	1.62	15.4	4	70.5	0.35	14.8	5	4	67.9	5
AREA AVERAGE		60.9	33.1	40	3	1.55	14.6	4	70.8	0.34	14.0	5	4	67.1	5
CROP YEAR AVERAGES															
1978 AVERAGE		59.8	34.9	36	4	1.75	14.3	4	70.7	0.40	13.6	5	4	63.0	4
1979 AVERAGE		59.8	31.7	34	3	1.66	13.7	3	69.7	0.39	12.7	5	3	63.8	5
1980 AVERAGE		59.4	31.1	32	4	1.71	14.4	4	70.0	0.39	13.7	5	4	65.7	6
1981 AVERAGE		58.9	29.9	23	5	1.66	14.2	4	69.5	0.39	13.3	5	4	64.1	7
1982 AVERAGE		59.9	32.2	36	4	1.68	14.7	4	70.5	0.38	13.9	5	4	65.9	5
1978-1982 AVG		59.6	32.0	32	4	1.69	14.3	4	70.1	0.39	13.4	5	4	64.5	5

QUALITY DATA OF UNIFORM REGIONAL BLENDS

AREA AND CROP-YEAR AVERAGES

TABLE 4 (Cont.)

VARIETY	STD	BAKE ABS % 2/	MIX TIME MIN	DOUGH CHAR 5/	CRUMB COLOR 6/	CRUMB GRAIN 7/	LOAF VOL CC	BAKE SCORE ***	GENERAL SCORE ***	DEFICIENCIES TW	KW	SM	WA	WP	EX	A65	FP	MC	MX	BA	MT	DC	CC	CG	LV
SOUTHEASTERN AREA AVERAGES																									
UTTE	S	68.6	5.00	8	100 7	88 6	825	4	4.0															MI	
HRIS	S	66.3	4.00	9	102 7	88 6	920	4	4.0		MI		MI											MI	
RA		65.3	4.00	9	101 7	87 6	875	4	3.7		MI	MI	MI	MI										MI	
ALDRON	S	67.3	4.00	8	100 7	89 12	885	4	4.0				MJ												
REA AVERAGE		66.1	4.25	8	101 7	88 6	868	4	4.0															MI	
NORTHEASTERN AREA AVERAGES																									
UTTE	S	66.8	3.25	9	102 8	88 6	850	4	4.0															MI	
HRIS	S	67.2	3.00	8	101 7	89 6	870	4	4.0		MI		MI											MI	
RA		64.7	4.00	9	102 8	89 6	855	4	3.3		MJ			MI										MI	
ALDRON	S	65.2	3.25	9	101 8	88 6	875	4	4.0				MI											MI	
REA AVERAGE		65.6	4.75	6	101 7	88 7	872	4	4.0		MI		MI									MI		MI	
WESTERN AREA AVERAGES																									
UTTE	S	68.0	3.00	9	100 7	88 6	815	4	4.0															MI	
HRIS	S	68.1	3.25	8	101 7	88 6	825	4	4.0		MI													MI	
RA		65.9	4.00	8	102 8	89 6	825	4	3.7					MI										MI	
ALDRON	S	68.9	3.00	9	101 8	87 3	870	3	3.7															MJ	
REA AVERAGE		67.8	4.00	7	101 7	87 6	819	4	4.0															MI	
CROP YEAR AVERAGES																									
978 AVERAGE		63.7	3.25	8	101 7	87 2	935	3	3.7				MI											MJ	
979 AVERAGE		64.1	4.00	9	101 7	88 4	944	4	3.3					MI			MI							MI	
980 AVERAGE		66.5	4.50	9	101 7	88 4	948	4	4.0				MI											MI	
981 AVERAGE		65.0	5.00	9	101 6	87 2	907	3	3.7		MI								MI			MI		MJ	
982 AVERAGE		66.5	4.25	7	101 7	88 6	853	3	3.7															MI	MI
978-1982 AVG		65.1	4.25	8	101 7	88 4	917	4	4.0															MT	

See page 30 for footnotes.

QUALITY DATA OF SPRING WHEAT SAMPLES 1982 CROP

STATE=NORTH DAKOTA STATION=WILLISTON NURSERY=UNIFORM

TABLE 5

VARIETY	STD	TEST WT #/BU 1/	1000 K.WT G.	SIZING LG %	SIZING SM %	WHT ASH % 2/	WHT PRO % 2/	WHEAT SCORE ***	FLR EXT %	ASH @ 65%EX % 2/	FLR PRO % 2/	MILL CHAR 3/	MILL SCORE ***	MIX ABS %	MIX PAT 4/
1982 N.D. STD	S	62.5	34.0	56	2	1.68	14.6	4	59.7	0.48	14.1	5	4	64.2	7
ALEX		62.0	30.1	27	2	1.43	15.9	4	59.0	0.40	15.7	5	4	65.0	8
OLAF		62.0	33.6	33	1	1.39	15.8	4	58.5	0.37	15.4	5	4	64.2	9

TABLE 5 (Cont.)

VARIETY	STD	BAKE ABS % 2/	MIX TIME MIN	DOUGH CHAR 5/	CRUMB COLOR 6/	CRUMB GRAIN 7/	LOAF VOL CC	BAKE SCORE ***	GENERAL SCORE ***	DEFICIENCIES TW	KW	SM	WA	WP	EX	A65	FP	MC	MX	BA	MT	DC	CC	CG	LV
1982 N.D. STD	S	64.2	7.25	9	100 7	87 6	187	3	3.7										MI		MI				MI
ALEX		65.0	6.50	9	100 7	86 3	185	2	3.3			MI							MI		MI				MJ
OLAF		64.2	6.50	3	101 8	87 3	187	1	3.0										MJ		MI	MJ			MJ

DEFICIENCIES	TW	KW	SM	WA	WP	EX	A65'	FP	MC	MX	BA	MIX TIME (MT)		DC	CC	CG	LV
MINOR FAULTING VALUES	57.9	31.9	8	1.71	13.9	57.6	.57	12.9	3	2,7,8	61.9	5.75-8.00	2.00-2.75	6	6	7	166
MAJOR FAULTING VALUES	56.9	28.9	16	1.81	12.9	55.6	.61	12.4	2	1,9-11	60.4	UNDER 1.75	OVER 8.00	4	3	3	156

*** 1=NO PROMISE 2=LITTLE PROMISE 3=SOME PROMISE 4=GOOD PROMISE.

See page 30 for footnotes.

QUALITY DATA OF SPRING WHEAT SAMPLES 1982 CROP

STATE=NORTH DAKOTA STATION=LANGDON NURSERY=UNIFORM

TABLE 6

VARIETY	STD	TEST WT #/BU 1/	1000 K.WT G.	SIZING LG %	SIZING SM %	WHT ASH % 2/	WHT PRO % 2/	WHEAT SCORE ***	FLR EXT %	ASH @ 65%EX % 2/	FLR PRO % 2/	MILL CHAR 3/	MILL SCORE ***	MIX ABS %	MIX PAT 4/
1982 N.D. STD	S	62.5	34.0	56	2	1.68	14.6	4	59.7	0.48	14.1	5	4	64.2	7
MPY-2		62.1	38.8	68	1	1.65	14.3	4	48.8	0.44	13.3	3	1	62.5	4
MPY-3		61.3	41.0	75	1	1.66	14.2	4	53.1	0.47	13.6	4	2	63.2	5

TABLE 6 (Cont.)

VARIETY	STD	BAKE ABS % 2/	MIX TIME MIN	DOUGH CHAR 5/	CRUMB COLOR 6/		CRUMB GRAIN 7/		LOAF VOL CC	BAKE SCORE ***	GENERAL SCORE ***	DEFICIENCIES TW	KW	SM	WA	WP	EX	A65	FP	MC	MX	BA	MT	DC	CC	CG	LV
1982 N.D. STD	S	64.2	7.25	9	100	7	87	6	187	3	3.7												MI		MI		MI
MPY-2		62.5	3.75	5	102	8	88	3	174	3	2.7						MJ		MI					MI			MJ
MPY-3		63.2	4.50	2	101	8	87	3	182	1	2.3						MJ							MJ			MJ

DEFICIENCIES	TW	KW	SM	WA	WP	EX	A65	FP	MC	MX	BA	MIX TIME (MT)		DC	CC	CG	LV
MINOR FAULTING VALUES	57.9	31.9	8	1.71	13.9	57.6	.57	12.9	3	2.7,8	61.9	5.75-8.00	2.00-2.75	6	6	7	166
MAJOR FAULTING VALUES	56.9	28.9	16	1.81	12.9	55.6	.61	12.4	2	1.9-11	60.4	UNDER 1.75	OVER 8.00	4	3	3	156

*** 1=NO PROMISE 2=LITTLE PROMISE 3=SOME PROMISE 4=GOOD PROMISE.

See page 30 for footnotes.

QUALITY DATA OF SPRING WHEAT SAMPLES 1982 CROP

STATE=ARIZONA STATION=MESA NURSERY=FIELD PLOTS

TABLE 7

VARIETY	STD	TEST WT #/BU 1/	1000 K.WT G.	SIZING LG %	SIZING SM %	WHT ASH % 2/	WHT PRO % 2/	WHEAT SCORE ***	FLR EXT %	ASH @ 65%EX % 2/	FLR PRO % 2/	MILL CHAR 3/	MILL SCORE ***	MIX ABS %	MIX PAT 4/
1982 N.D. STD	S	62.5	34.0	56	2	1.68	14.6	4	72.6	0.36	13.7	5	4	66.0	6
ABU GHRAIB		62.0	30.5	11	6	1.22	11.4	2	67.3	0.39	10.1	5	1	65.0	7
CAJEME		63.7	55.2	89	1	1.21	13.2	3	72.6	0.39	11.8	5	2	65.0	5
GENARA		64.7	43.7	75	2	1.33	13.3	3	72.1	0.42	11.9	5	2	64.0	3
GLENNSON		65.0	44.2	74	2	1.42	13.6	3	71.5	0.46	11.6	5	2	65.3	4
HERMOSILLO		63.7	46.1	76	2	1.27	13.4	3	73.3	0.37	12.2	5	2	69.1	5
PROBRAND 771		63.5	45.7	67	2	1.16	12.4	2	73.0	0.33	11.3	5	2	64.2	5
SONALIKA		61.8	47.1	65	4	1.16	10.8	2	70.9	0.36	9.6	5	2	63.8	2
VEERY #4		65.0	38.9	61	1	1.15	12.4	2	71.7	0.36	11.2	5	2	64.2	3
WESTBRED 911		64.2	46.5	70	1	1.20	12.3	2	69.6	0.39	10.9	5	1	65.0	5
YECORA 70		62.0	40.0	28	3	1.23	11.3	2	70.4	0.41	10.2	5	1	60.3	10
YECORA ROJO (A)		62.1	39.2	31	3	1.26	10.8	2	68.4	0.40	9.8	5	1	58.7	11
YECORA ROJO (B)		63.5	50.3	78	1	1.24	13.1	3	72.0	0.38	11.7	5	2	67.0	7
C79-97		62.4	35.1	19	4	1.14	10.2	2	71.5	0.40	9.0	5	2	59.0	6
C79-253		62.9	47.6	74	1	1.21	12.1	2	71.3	0.43	10.6	5	2	65.0	7
C79-268-1		62.6	46.7	76	1	1.24	11.9	2	63.6	0.43	10.4	4	1	62.3	6
M80-68-320		61.1	32.6	19	6	1.25	11.7	2	69.7	0.40	10.4	5	1	62.3	10
906-R (A)		62.6	39.8	70	2	1.28	11.9	2	70.3	0.43	10.9	5	1	61.9	7
906-R (B)		63.5	45.8	81	1	1.33	13.6	3	70.9	0.40	12.3	5	2	67.6	6

QUALITY DATA OF SPRING WHEAT SAMPLES 1982 CROP

TABLE 7 (Cont.) STATE=ARIZONA STATION=MESA NURSERY=FIELD PLOTS

VARIETY	STD	BAKE ABS % 2/	MIX TIME MIN	DOUGH CHAR 5/	CRUMB COLOR 6/	CRUMB GRAIN 7/	LOAF VOL CC	BAKE SCORE ***	GENERAL SCORE ***	DEFICIENCIES TW	KW	SM	WA	WP	EX	A65	FP	MC	MX	BA	MT	DC	CC	CG	LV
1982 N.D. STD	S	66.0	4.75	6	100 7	89 12	845	4	4.0													MI			
ABU GHRAIB		66.6	4.00	1	102 5	86 7	715	1	1.3			MI		MJ	MJ		MJ		MI			MJ	MI	MI	MJ
CAJEME		66.4	3.75	5	102 2	87 6	740	1	2.0					MI			MJ					MI	MJ	MI	MJ
GENARA		65.6	2.00	2	102 4	86 6	745	1	2.0					MI			MJ				M1	MJ	MI	MI	MI
GLENNSON		67.0	2.75	1	103 5	87 6	815	1	2.0					MI			MJ				MI	MJ	MI	MI	
HERMOSILLO		71.5	2.50	2	102 6	86 6	800	1	2.0					M1			MJ				MI	MJ	MI	MI	
PROBRAND 771		65.9	4.00	5	102 7	87 3	730	1	1.7					MJ			MJ					MI		MJ	MJ
SONALIKA		66.6	1.75	1	102 8	87 7	695	1	1.7					MJ			MJ		MI		MJ	MJ	MI	MJ	MJ
VEERY #4		66.2	2.50	1	102 4	87 2	675	1	1.7					MJ			MJ				MI	MJ	MI	MJ	MJ
WESTBRED 911		66.8	4.00	1	102 7	85 3	705	1	1.3					MJ	MI		MJ					MJ		MJ	MJ
YECORA 70		62.8	6.50	5	103 9	86 6	700	1	1.3					MJ	MI		MJ		MJ		MI	MI		MI	MJ
YECORA ROJO (A)		62.1	6.75	5	102 7	87 1	665	1	1.3					MJ	MJ		MJ		MJ		MI	MI		MJ	MJ
YECORA ROJO (B)		69.0	4.50	5	101 6	87 6	735	2	2.3					MI			MJ		M1			M1	MI	MI	MJ
C79-97		64.1	5.75	2	101 7	86 3	640	1	1.7					MJ			MJ				MI	MJ		MJ	MJ
C79-253		66.8	5.25	1	102 8	88 10	715	1	1.7					MJ			MJ		MI			MJ			MJ
C79-268-1		64.3	4.50	2	103 6	87 2	680	1	1.3					MJ	MJ		MJ					MJ	MI	MJ	MJ
M80-68-320		64.2	8.75	2	102 7	88 6	740	1	1.3					MJ	MI		MJ		MJ		MJ	MJ		MI	MJ
906-R (A)		63.3	4.75	2	102 7	86 6	755	1	1.3					MJ	MI		MJ		MI			MJ		MI	MI
906-R (B)		69.4	4.00	1	102 8	87 6	760	1	2.0					M1			MJ					MJ		MI	MI

DEFICIENCIES	TW	KW	SM	WA	WP	EX	A65	FP	MC	MX	BA	MIX TIME (MT)		DC	CC	CG	LV
MINOR FAULTING VALUES	57.9	31.9	8	1.71	13.9	70.5	.47	12.9	3	2,7,8	61.9	5.75-8.00	2.00-2.75	6	6	7	790
MAJOR FAULTING VALUES	56.9	28.9	16	1.81	12.9	68.5	.51	12.4	2	1,9-11	60.4	UNDER 1.75	OVER 8.00	4	3	3	740

*** 1=NO PROMISE 2=LITTLE PROMISE 3=SOME PROMISE 4=GOOD PROMISE.

See page 30 for footnotes.

QUALITY DATA OF SPRING WHEAT SAMPLES 1982 CROP

STATE=CALIFORNIA STATION=IMPERIAL VALLEY NURSERY=FIELD PLOTS

TABLE 8

VARIETY	STD	TEST WT #/BU 1/	1000 K.WT G.	SIZING LG %	SIZING SM %	WHT ASH % 2/	WHT PRO % 2/	WHEAT SCORE ***	FLR EXT %	ASH @ 65%EX % 2/	FLR PRO % 2/	MILL CHAR 3/	MILL SCORE ***	MIX ABS %	MIX PAT 4/
1982 N.D. STD.	S	62.5	34.0	56	2	1.68	14.6	4	72.7	0.36	13.6	5	4	64.7	6
ANZA		64.6	37.2	65	1	1.42	11.6	2	72.9	0.38	10.3	5	2	61.3	5
BOUNTY 309		64.0	49.0	59	2	1.47	14.9	4	69.0	0.41	11.6	5	1	65.3	4
CAJEME		64.2	36.1	76	1	1.47	13.9	3	72.0	0.40	12.6	5	3	65.0	5
LACHISCHE		64.1	48.5	82	1	1.51	13.2	3	69.1	0.40	11.5	5	1	62.3	3
OSLO		63.4	39.7	48	2	1.45	13.1	3	72.3	0.37	12.5	5	3	62.8	3
PAVON		64.9	42.0	68	1	1.47	12.4	2	69.4	0.38	10.7	5	1	64.4	6
PROBRED		63.9	47.6	75	1	1.43	13.4	3	71.8	0.38	12.1	5	2	61.7	5
PROBRAND 771		62.2	43.3	62	1	1.51	12.7	2	73.2	0.37	11.8	5	2	63.2	5
WESTBRED 911		63.9	44.6	74	1	1.40	12.8	2	68.2	0.39	11.2	5	1	64.2	6
YECORA ROJO		64.4	48.1	76	1	1.47	13.8	3	71.2	0.39	12.6	5	3	65.7	4
HRS 8775806		64.2	37.9	59	1	1.62	14.0	4	68.7	0.40	12.5	5	2	62.8	5
SGY 022		63.7	47.1	68	1	1.47	13.3	3	70.7	0.40	12.1	5	2	66.0	4
SGY 069 B		64.4	42.2	70	1	1.61	14.5	4	69.7	0.34	13.8	5	3	64.2	3
77S 3940		64.4	43.1	73	1	1.50	13.1	3	72.0	0.40	12.3	5	2	64.2	3
77S 4236		62.9	37.3	45	2	1.55	12.3	2	73.3	0.40	11.3	5	2	65.7	5
79CS 2437		64.0	48.3	78	1	1.46	13.8	3	71.1	0.39	12.3	5	2	65.7	6

QUALITY DATA OF SPRING WHEAT SAMPLES 1982 CROP

TABLE 8 (Cont.) STATE=CALIFORNIA STATION=IMPERIAL VALLEY NURSERY=FIELD PLOTS

VARIETY	STD	BAKE ABS % 2/	MIX TIME MIN	DOUGH CHAR 5/	CRUMB COLOR 6/	CRUMB GRAIN 7/	LOAF VOL CC	BAKE SCORE ***	GENERAL SCORE ***	DEFICIENCIES TW	KW	SM	WA	WP	EX	A65	FP	MC	MX	BA	MT	DC	CC	CG	LV
1982 N.D. STD	S	65.0	4.25	8	100 7	90 12	875	4	4.0																
ANZA		61.1	2.00	1	102 8	87 7	660	1	1.7					MJ			MJ			MI	MI	MJ		MI	MJ
BOUNTY 309		65.4	3.00	2	103 9	85 2	780	1	2.0						MI		MJ					MJ		MJ	MI
CAJEME		65.8	3.25	2	102 8	86 2	820	1	2.3					MI			MI					MJ		MJ	MI
LACHISCHE		64.1	2.00	1	102 8	87 6	715	1	1.7					MI	MI		MJ				MI	MJ		MI	MJ
OSLO		63.4	2.75	5	100 7	86 6	775	2	2.7					MI			MI				MI	MI		MI	MI
PAVON		64.4	2.50	2	102 8	88 12	775	1	1.3					MJ	MI		MJ				MI	MJ			MI
PROBRED		62.5	3.50	6	103 9	89 12	790	3	2.7					MI			MJ					MI			MI
PROBRAND 771		63.5	3.75	6	102 8	88 7	790	3	2.3					MJ			MJ					MI		MI	MI
WESTBRED 911		66.4	4.00	7	102 8	87 3	725	1	1.3					MJ	MJ		MJ							MJ	MJ
YECORA ROJO		66.0	3.50	7	102 8	89 6	800	3	3.0					MI			MI							MI	MI
HRS 8775806		65.0	3.00	2	102 8	86 3	795	1	2.3						MI		MI					MJ		MJ	MI
SGY 022		66.1	3.25	7	102 8	87 6	750	2	2.3					MI			MJ							MI	MJ
SGY 069 B		64.3	3.00	8	101 8	88 10	815	3	3.3						MI										MI
77S 3940		66.2	2.50	6	100 7	87 12	710	1	2.0					MI			MJ				MI	MI			MJ
77S 4236		65.9	3.75	5	102 7	88 12	755	2	2.0					MJ			MJ					MI			MJ
79CS 2437		66.5	3.00	5	102 8	89 12	810	3	2.7					MI			MJ					MI			MI

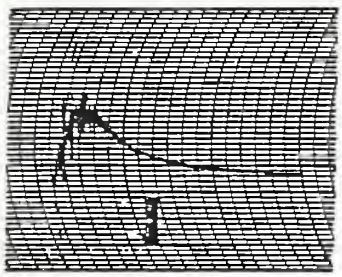
DEFICIENCIES	TW	KW	SM	WA	WP	EX	A65	FP	MC	MX	BA	MIX TIME (MT)		DC	CC	CG	LV
MINOR FAULTING VALUES	57.9	31.9	8	1.71	13.9	70.6	.47	12.9	3	2.7-8	61.9	5.75-8.00	2.00-2.75	6	6	7	820
MAJOR FAULTING VALUES	56.9	28.9	16	1.81	12.9	68.6	.51	12.4	2	1.9-11	60.4	UNDER 1.75	OVER 8.00	4	3	3	770

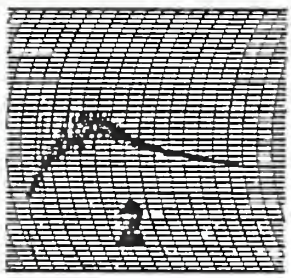
*** 1=NO PROMISE 2=LITTLE PROMISE 3=SOME PROMISE 4=GOOD PROMISE.

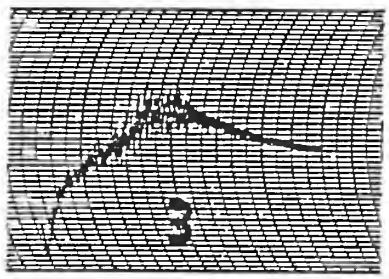
See page 30 for footnotes.

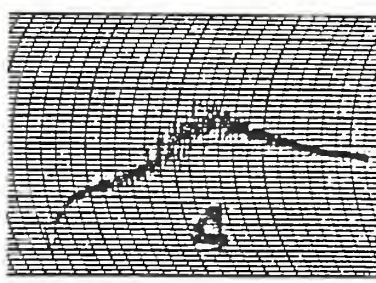
REFERENCE MIXOGRAMS

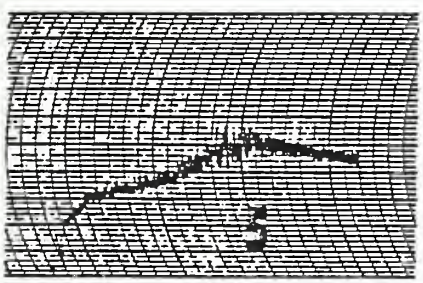
HARD RED SPRING WHEAT

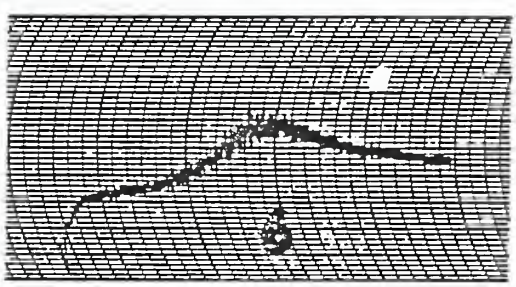


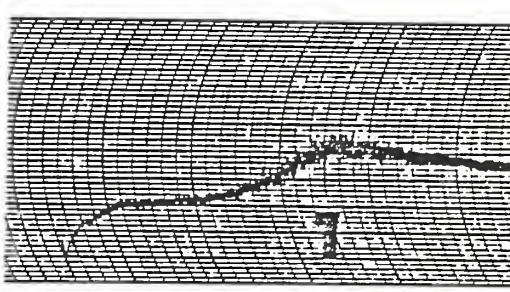


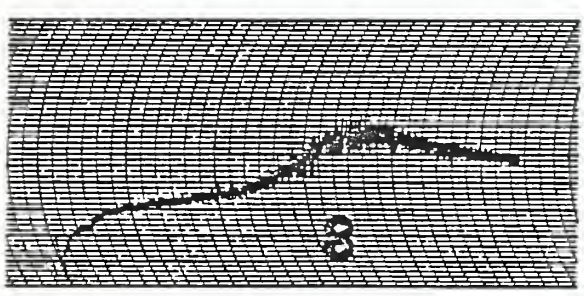


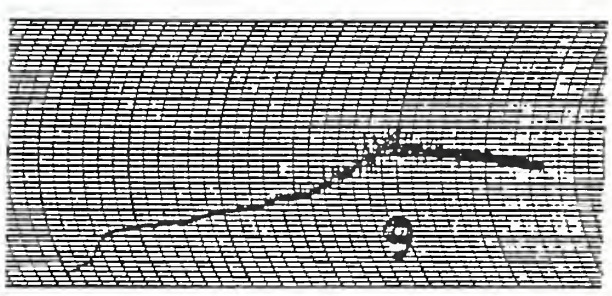


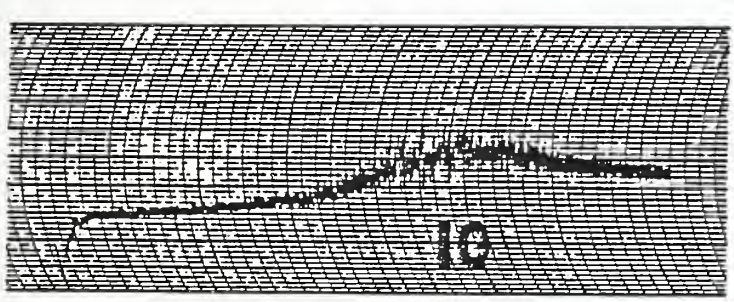


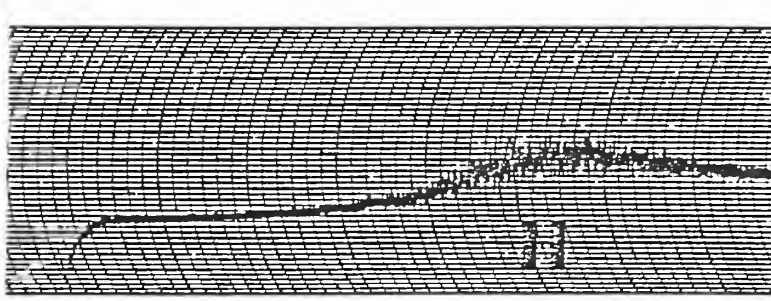












U.S.D.A. SPRING WHEAT QUALITY LABORATORY

FARGO, NORTH DAKOTA